Theoretical study of the stretched-pulse erbium-doped fiber laser

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Résumé en anglais	The mode-locking properties of a stretched-pulse erbium-doped fiber laser are theoretically investigated. We consider a unidirectional ring cavity composed of a birefringent erbium-doped fiber and a birefringent undoped fiber. An intracavity polarizer is used to achieve mode locking through nonlinear polarization rotation. The model takes into account the orientation of the eigenaxes of both fibers as well as the orientation of the intracavity polarizer. A master mode-locking equation is derived for the envelope of the electric field. This allows an analytic investigation of the stability of the mode-locking solution as a function of the angle between the eigenaxes of the two fibers. It is demonstrated that the optimization of the ranges of mode locking requires the alignment of the eigenaxis of the two fibers.
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[1] http://okina.univ-angers.fr/m.salhi/publications
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[3] http://okina.univ-angers.fr/francois.sanchez/publications
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[5] http://dx.doi.org/10.1103/PhysRevA.68.033815
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